

DEPLETION OF OZONE WITH CLIMATE CHANGE LEADS TO END EARTH LIFE

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ABSTRACT

The Paper is based on the results of “Chemical reaction of hazardous gases with Ozone”. It is a research project with an objective of improving ozone layer thickness. More-specially it will discuss the earth’s atmosphere, life on earth and habitability. The project aims at increasing life span of human, flora and fauna on earth. The article also deals with distribution of resources. It is also going to give livelihood resources to all of us on earth. This will help us to develop or create habitable conditions on other planet like mars.

KEYWORDS: “Chemical Reaction of Hazardous Gases with Ozone, Earth Life, Flora and Fauna, Earth

INTRODUCTION

At standard temperature and pressure two atoms of oxygen laid to form di-oxygen, O_2 a diatomic gas necessary for respiration of combustion (Please see annexure 01). Oxygen at temperature and pressure however will form a molecule with three oxygen atoms, O_3 called ozone. This is earth’s own natural sunscreen that shields us from radiation. It absorbs 97-99% of Sun’s high frequency ultraviolet(UV), which is potentially damaging to life and livelihood resources on earth. These UV rays also create health problems. Ozone is formed in the layer of earth’s atmosphere called the Stratosphere laying between 8 to 10 miles and 30 miles (50 km.) above the sea level. It is thinnest at equator and thickest at poles. It’s attitude and thickness varies with latitudes.

O_2 ----- Two oxygen atoms or garden oxygen, O_3 ----- Ozone.

O_2 -----> $O+O$. (One of these again joins with O) $O+ O_2$ -----> O_3 (Ozone).

Note: oxygen atom may covert in to ozone by bonding with oxygen molecule and sun light rays. Dun light will break ozone into oxygen atoms and molecules. All these happened with oxygen and sun light rays only at particular temperature and pressure only.

Ozone is formed in the Stratosphere from O_2 by the action of atmospheric elective discharge sunlight (UV-rays). Stratospheric ozone is destroyed by the action of chlorine and high (energy) frequency ultra-violet light rays in sun light causes oxygen molecules to split in to oxygen atoms. UV- rays are more effective at equator and less effective at poles. Hence, the ozone layer thickness at poles is greater than that at the equator.

The ozone found at earth surface, known as “ground level ozone”. It is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight (Please see annexure 02). The Layer, stratospheric ozone sometimes gets confused with the ozone lying near earth surface, should not be confused with the stratosphere’s ozone. The ground level ozone occurs naturally and most of it produced by the reaction of UV- sunlight rays with chemicals found mainly in automobile exhaust and gasoline vapors. Ironically, we have most ozone

at ground level and not enough above earth atmosphere. The ozone at ground level is photochemical smog and is hazardous to health. UV light rays play a major role in forming Ozone. Ozone plays a great role in stopping UV light rays from entering into earth's atmosphere. This phenomenon protects lives of humans, flora and fauna from diseases. That means there is a good bonding relation between oxygen molecule, Ozone and UV rays in protecting life and livelihood on earth. Stopping Ozone layer depletion is one of the major challenges faced by the world today. Ozone layer is truly a "Conserver of life" essential to the survival of all living things. This is also playing a major role with climate change or Global warming.

Since the industrial revolution, especially in recent times there is increase in vehicle and industrial pollution which release hazardous gases. Certain light weight hazardous gases such as CFC are reach the upper layer of atmosphere weaken the bonds of ozone. These gases reach the poles because of constant temperature and weather conditions and stay there for a few days and slowly react with gases and break the ozone bonds. These gases at equator migrate to the poles. Stratospheric cooling is also predicted from increases in green house gases such as CO, C O₂ etc

Ozone Holes

Ozone hole is not actually a hole, rather it is a term used to refer to the original thinning of the ozone layer over Antarctica, due to stratospheric chlorine. Other more moderate depletion (thinning) of ozone layer are also referred to as "ozone holes". The ozone hole is usually expressed in the Dobson units, it is a measure of the reduction in the total column ozone above a point on the earth's surface. It would be about 300 to 500 Dobson units or 3 to 5mm (1/8 of inch) thick (Please see annexure 03).

A reaction that takes place in polar stratospheric clouds (PSCs) play an important role in enhanced ozone depletion. PSCs form more radically in the extreme cold of Antarctic stratosphere. That's why ozone holes formed and are deeper over Antarctica. Earlier scientists' models failed to take PSCs into account and in predicting ozone depletion. Hence, Antarctic ozone hole is a surprise to many scientists. The decrease in ozone layer was predicted in the early 1980s and estimated a decrease of 7% over a 60 years period. First ozone hole was reported by Farman et al(1985) in Antarctica region (Please see annexure 04). In 2006, a 2.5million square kilometer ozone hole was detected over Tibet. Again in 2011, an ozone hole appeared over mountainous region of Tibet, Xinjiang, Qinghai and the Hindu Kush, along with a unprecedentedly hole over the Arctic. The Tibet one is far less intense than the ones over the arctic and Antarctic. Between Dec 2010 and March 2011 up to 80% of the ozone in the atmosphere at about 20 kilometers above the surface was destroyed. According to the scientists, the level of ozone depletion was quite severe and it can be compared to the ozone hole that forms over Antarctica every winter.

Ozone Depletes With Hazardous Gases

Chlorofluorocarbons (CFCs), halogens (Chlorine and Bromine) and other manmade chemicals are mainly responsible for ozone depletion. Chlorofluorocarbons are invented by Thomas midgley.Jr.in 1920's. As mentioned above when such ozone depleting chemicals reach the stratosphere, they get disassociated by ultraviolet (UV) light to release Chlorine atoms. These chlorine atoms act as a catalyst and each chlorine atom can breakdown thousands of ozone molecules before being removed from the stratosphere (Please see annexure 05). CFC molecule takes five to seven years to go from ground level to upper atmosphere. The catalyze ozone depletion can take place in gas phase and improves in the presence of Polar stratospheric clouds (PSCs). This depletion of ozone layer is an increase of UV radiation, which is

hazardous to life.

Health Hazardous

Ozone may form close to earth's surface or in high altitudes. Ground level ozone is a major component of photochemical smog and is bad for health. It is caused by the effect of ultra violet-B rays on nitrogen oxide from vehicle exhaust. This Ozone affects lung functions. It can aggravate asthma and other chronic respiratory track problems. It also reduces lung functions and increases diseases in the short term or permanently. High energy Ultra Violet (UV) sun rays, travelling through Ozone are very dangerous. UV – B sunrays affect life span of humans, animals and birds.

A study under took skin biopsies of over 150 whales in the Gulf of California and found “wide spread evidence of epidermal damage commonly associated with acute severe sunburn” due to the damage of the DNA by UV radiation (Please see annexure 06). Rising UV levels as a result of Ozone depletion are to be blamed for the observed skin damage and for the increase in the incidence of skin cancer in recent times.

The ozone layer depletion also affects crops. A number of important species of plants such as rice depend on “cyanobacteria” residing on their roots for the retention of nitrogen (Please see annexure 07). Cyanobacteria are sensitive to UV radiation and would have an effect on roots with UV radiation. Plants limited ability to adopt to increased level of UV-B rays, therefore plant growth and productivity can be directly affected by UV-B radiation. Farmers are giving more fertilizers again and again for growth and getting low productivity. These kinds of grains are not reaching the export quality in some countries. All these are increasing production cost, increasing pests in grains and decreasing nutrition level in all feeding areas of humans, flora and fauna. It will affect economies by increasing subsidies cost. One more thing is that Population growth is also harms ozone.

Ozone is Expanding With High Population

Due to an increase in population there is an increase in industrialization leading to deforestation at a large scale. Due to human activity there is an increase in pollution both vehicle and industries, which is leading to an increase in greenhouse gases. This is resulting in ozone depletion. However it has been proved that on the planet as per physics theory magnetism, gravity, sound wave travel, friction ...etc works only on the basis of oxygen and ozone. On any planet survival of any livelihood proved only because of existence of oxygen and ozone. Now there is no livelihood on the same planet is due to absence of oxygen and ozone.

CONCLUSIONS

To restore the carbon dioxide – oxygen balance we need to protect forest at a large scale. Avoid the use of aerosols or sprays of any form. Do not use appliances running on CFC. Reduce the use of energy which involves petroleum. Reduce use of pesticides in agriculture. This will protect ozone layer, which in term will protect us from harmful UV radiation from the sun. Reduce Global Warming and away us from the consequences of it.

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